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ABSTRACT

The functions of blocking text with horizontal rules and providing headings of different types are discussed. Headings may be encoded or function as access structures, while blocking segments text and provides retrieval cues. These issues were tested in two experiments. College students read a 2000-word passage. In the first experiment, no encoding advantage for blocking or semantic headings were found on a probed recall task or recall of passage topics. In the second experiment, semantic markers were compared with question headings and content markers (e.g., Definition, Examples, Introduction). Content markers debilitated probed recall performance. No differences occurred on the topic recall task or an information retrieval task. It was concluded that headings benefit only younger, less developed learners. Older, skilled learners employ their own strategies which often don't involve headings. The text of this paper is blocked and headings are provided to illustrate the functions. (Author/PN)

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Blocking and Types of Headings in Text: Effects on Recall and Retrieval

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Running head: Headings

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Blocking Textual Units

Functions of blocking

A number of text writing systems, such as information mapping (Horn, 1976), make extensive use of horizontal rules to divide text into units. This blocking of text serves a variety of functions:

* associates passages in a holistic fashion, ie. chunking prose into units
* provides locational retrieval cues
* facilitates comparison of segments of a passage

Rationale

The use of blocking, though unverified, should serve the functions stated above, because:

* Information in blocks becomes unitized, facilitating semantic comparison with other units (Gropper, 1970).
* Encoding of spatial attributes in memory facilitates recall (Christie & Just, 1976)

Purpose of study

This study sought to assess the effects of blocking on recall of information from text.

Functions of Headings

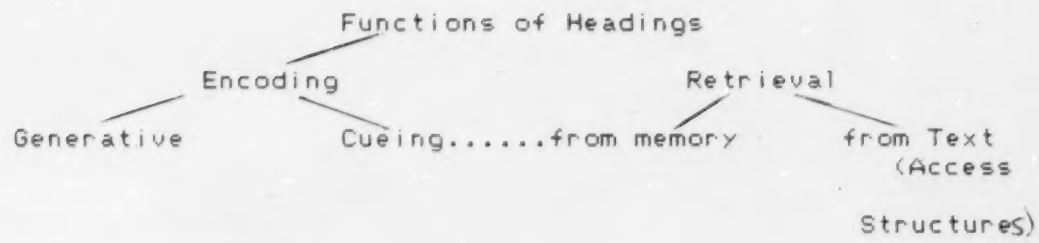

Figure 1

How do headings function?

Analysis of the effectiveness of headings in text must consider the function(s) served by them. Without such a functional context, we can only speculate as to why our experiments produce certain results. Headings may function in two different ways in helping the learner acquire knowledge from text - either during the initial encoding of information decoded from text into memory or as a retrieval mechanism that helps us retrieve information from memory or to locate desired information in the text.

Context for comprehension

In order to make sense out of what we read, it is necessary to relate what we read to what we already know. Our memories contain interrelated networks of concepts (schemata or scripts) that internally describe objects, events, situations, or ideas. We use these for

Context for comprehension, cont.

interpreting and assigning meaning to information in text as well as for making inferences about it and relating it to previously acquired knowledge. That is, "relating informaton to relevant aspects of prior knowledge is a critical part of the comprehension process (Bransford & Johnson, 1973, p. 409). Headings can function first as cueing devices that activate appropriate schemata or scripts that ir turn act as a context for comprehending what is presented. For what gets stored in memory depends only partly on what is presented in the text. In the absence of an appropriate context for interpreting text, that is, if you have no existing knowledge that will explain or provide examples of what you are reading, then comprehension and memory for the discourse are adversely affected. The more novel or ambiguous the text, the more we need contextual cues. In a series of studies which presented ambiguous text, comprehension and memory were greatly improved simply by inserting titles or headings (Bransford & Johnson, 1972; Dooling & Lachman, 1971). These headings cued the recall of appropriate knowledge structures which functioned as a script for interpreting (providing the context for comprehension) what was presented in text. Comprehension of the text depended upon these <u>semantic prerequisites</u> (Bransford & Johnson, 1972).

Familiarity of context

The context that is activated will determine the meaning assigned to the text. The more familiar the context used to interpret the text, the more schemata that are interrelated and available and the better comprehended and remembered the passage will be. Anderson, Spiro, and Anderson (1978) in fact found that more familiar settings used to interpret a passage resulted in greater recall and comprehension.

How do headings affect recall?

Although the research cited above provides a conceptual rationale for using headings, it employed intentionally ambiguous prose to prove the importance of context on comprehension. The effectiveness of headings needs to be verified with organized, meaningful, and concrete prose. Will headings serve the same contextual function for prose that has more meaning, ie., that activates more schemata?

Research findings

A number of early studies found that headings produce no better recall than non-cued text.

* Robinson & Hall (1941) - No adjunct organizational devices had an effect.
* Christenson & Stordahl (1955) - No differences on immediate or delayed recall
* Klare, Shuford, & Nichols (1958) - No main effects, but low-aptitude learners profitted more.

In a systematic attempt to analyze headings and the

parameters of their effectiveness, Hartley and his colleagues have produced consistent support for their use.

* Hartley, Kenely, Owen, & Trueman -Headings helped children recall more facts and main points.

* Hartley & Trueman (1982) - Replicated findings with older children using statement and question forms of headings.

Headings as organizers

A couple of studies indicate that sentence outlines, which were used like headings, functioned as organizers, producing more intentional learning (of cued material) when compared with overt responding (pretesting).

* Proger, Taylor, Mann, Couison, & Bayuk (1970) - No effect for incidental learning.

* Proger, Carter, Mann, Taylor, & Bayuk (1973) - Most effective for high ability girls.

Types of labels (headings)

"The purpose of labelling text elements is to identify and summarize the different elements that comprise text"(Duchastel, 1982, p.181). Labelling, a more generic term related to headings, includes the use of a variety of devices:

* <u>headings</u> - semantic markers summarizing the content of a section of prose

* <u>terminology markers</u> - signal new terminilogy and act as location markers for retrieval

* <u>content markers</u> - indicate the type or function of content (see Appendix for list)

* <u>marginal notes</u> - a running summary or explication of ideas in text

Types of labels, cont.

The term headings is used in this study in place of the broader term labels because of its familiarity. Headings, like labels, can assume a variety of forms and functions.

Effects of types of headings

Does the type of headings used affect the encoding process? Do headings in the form of questions produce more arousal, which would facilitate encoding and subsequent recall? Do semantic headings organize information better than content markers? The following studies indicate that differences between descriptive statements of content and questions usually depends upon individual differences in ability.

* Christenson & Stordahl - No difference between question or statement form
* Hartley, Kenely, Owen, & Trueman (1980) - While both effective, questions benefit lower ability learners more.
* Hartley, Morris, & Trueman (1981) - With remedial learners, question heading group performed better.
* Hartley & Trueman (1982) - No comarison made; both effective.

Learner-generated headings

The generative model of learning contends that comprehension occurs when readers construct meaning for text by activating appropriate prior knowledge while comprehending. Meaning is dependent on the store of memories and distinctive experiences that a reader can

Learner-generated headings, cont.

apply to any text. So, if learners are stimulated to construct elaborations for text rather than relying on those provided by the author, recall sould improve. When Doctorow, Wittrock, and Marks (1978) gave instructions to leaners to write sentences from memory about each paragraph they read, that is, generate their own meaning for each paragraph, they comprehended better and recalled more than readers who received only headings. When headings were added to the generative processing, they functioned effectively as retrieval cues, improving the level of recall even more. In a similar study, DeeLucas and DiVesta (1980) found that the generative processing produced greater recall of text structure while headings only facilitated recall of subordinate (less important)information.

Text-provided vs. learner-generated headings

There are apparantly limits to the level of structure that can be generated by the learners. When asked to periodically construct and add to a two-dimensional conceptual hierarchy, few students were able to complete the task (Eggan & Kauchuk, 1978). When provided with such a hierarchical heading, learners improved their ability to interrelate concepts, yielding better comprehension of the passage. Because of the high level, structural nature of the headings, they facilitated high level information

Text-provided vs. learner-generated headings, cont.

recall, while providing no help for recall of subordinate information. Generating sentences or headings seems to facilitate comprehension, while text-provided headings provide retrieval cues for information at different levels in the content structure, depending upon the content level of the headings.

How to use headings

The equivocal research findings related to headings have led some researchers to question whether or not learners know how to properly utilize headings. If headings are to serve an encoding function, the way in which they are processed should definitely affect what gets stored in memory. Most studies have assumed that learners know intuitively how to process headings, that is, how to relate them to the content and use them as retrieval cues.

* Holley, Dansereau, Evans, Collins, Brooks & Larson - Trained groups to attend to embedded headings during input, relating headings to content or use topic outline to recall information from text and to memorize the topics. Training was ineffective. Student's normal (idiosyncratic) methods of using headings was insignificantly better.

* Brooks, Dansereau, Spurlin, & Holley (1981) - Given a checklist of cognitive activities during proper text processing, including developing expectations based upon headings, relating headings to content, memorizing headings and practicing recall, learners outperformed untrained group on non-cued tests (essays and outlines).

Miscueing with headings

If headings truly assume the role of anchoring points (contextual cues) around which text is organized, then

Miscueing with headings, cont.

biasing titles or headings should affect text comprehension (Kozminsky, 1977). That is exactly what happened when he presented titles that were dissonant to textual content. The proportion of propositions recalled was lower. Similar effects relative to retrieval of information have also been confirmed (Swarts, Flower, & Hayes, 1980). It seems that one of the best ways to verify the encoding function of headings is to confuse the learner by including headings dissonant to the meaning of the text and then measure the decremental effects.

Retrieval Functions

Retrieval from memory

If you subscribe to the encoding specificity hypothesis (Tulving & Thompson, 1973), then you believe that what gets encoded in memory determines what retrieval cues will be effective for information that was encoded and therefore associated with it. The weight of encoding evidence seems to suggest that when readers intentionally memorize headings, they function best as retrieval cues, especially for low-level or subordinate information. Two studies support this conclusion.

* Since elaborate training in the processing of headings resulted in better performance on non-cued tests, but untrained readers performed just as well on cued tests (short answer, multiple choice), headings can be inferred to have the greatest effects as retrieval aids (Brooks, et al, 1981).

* When asked to generate sentences from memory about each paragraph, learners almost always included the headings, indicating that they were involved in retrieval (Doctorow, et al, 1978).

Headings as access structures

One of the least researched but most obvious functions of headings relates to providing access to information in text. Since reading is most often a selective process, especially with non-narrative text, typographic cueing devices such as headings function most effectively as access structures (Waller,, 1979, 1982). In additional to providing an overview of textual content, headings identify and characterize particular units of text. The primary function of headings is to orient the readers to the text, allowing them to locate the information that they need (Waller, 1982). Headings can effectively signal the nature of the content of any part of text, faciliating the retrieval of information from it. The specific role that headings play depends upon the nature of the document and the reader's degree of familiarity with it (Swarts, et al, 1980). Hartley and Trueman (1982) have distinguished retrieval of information from familiar text and searching of unfamiliar text.

Retrieving information from text

If headings in text facilitate retrieval, readers should be able to locate information faster, or given the same amount of time, be able to locate more information.

Retrieving information from text, cont.

* Hartley & Trueman (1982) - Both statement and question headings produced faster retrieval of information from text.

* Jonassen & Falk (1980) - Using a mapped version of text, including extensive use of marginal headings, learners found 50% more answers in the same time.

* Charrow & Reddish - No differences in retrieving information in short warranties written in simple English which included headings.

Searching unfamiliar text

The retrieval role of headings should be even more important when trying to access information in text. In addition to helping locate information, they also provide an overview of the structure of a document.

* Hartley & Trueman (1982) - Both statement and question headings reduced the time spent searching for answers.

Characteristics of good headings

The access function depends upon meaningful, user-oriented construction of headings. Too often though, headings are vague and based on broad concepts rather than on user' needs (Swarts, et al, 1980). According to their studies, when headings miscue readers about the content of a section of text, that content is harder to predict and to reconcile to the readers' expectations based upon the headings. The authors therefore recommend the following guidelines for writing headings.

* Use the "scenario principle" for constructing examples of scenarios in which readers will most likely access text.

Characteristics of good headings, cont.

* Anticipate readers' questions.
* Clarify all terms used.
* Make sure definitional headings are short, accurate and specific.

Purpose of studies

The following studies reported in this paper examined the following issues:

* effects of headings on probed recall from text
* types of headings used (content, semantic markers, questions)
* effects of headings on retrieval of information
* aptitude x treatment interactions by type of headings

EXPERIMENT ONE

Purpose

The purpose of Experiment One was to see if the inclusion of horizontal rules or the specification of text unit content (semantic markers) affect probed recall of information or free recall of passage topics in text. To what extent would blocking or semantic markers affect the organization and construction of structural cues and to what extent would they be encoded and available during recall?

Methods

Participants

Forty upperclass, undergraduate students enrolled in two sections of a reading education course at a southeastern university.

Materials All of the experiments employed alternate versions of a 2000-word prose passage, "Communication in the Teaching Process" (Jonassen & Falk, 1980). The passage was chunked into 55 blocks of information, most a paragraph in leangth (none exceeded three). The 19 page passage was photoduplicated on 8 1/2 X 11 inch white stock with two illustrations on the last page.

Conditions In the continuous prose version (control), each paragraph of information was separated by an additional line feed. No additional spacing or cueing was used. In the blocked version of the passage, paragraphs were also separated by an additonal line feed. Between blocks of information, horizontal rules were drawn across the page the width of the text. In both of these versions, no headings were employed after the title, which appeared on a separate title page in all the versions. The headings version included marginal headings for each blocked unit of text which described the major point of the semantic content of the information contained therein.

Measurement The criterion, probed recall instrument (Spearman Brown reliability r=.83), used both as a pretest and posttest, consisted of 45 four-option multiple choice items. Content

validity was established by a panel of experts (Jonassen & Falk, 1980).

The topic recall instrument, administered directly after the passage was read, consisted of 25 blank lines on a sheet of paper with directions "to list as many of the major topics discussed in the paper you just read as possible" printed at the top of the page.

Procedures

The students were pretested during a regularly scheduled class period. One week following pretesting, the passages were distributed in a package to each student. They were instructed to read the passage at their own rate for understanding and that they would be tested on the infomation after they finished reading. Immediately following reading, students surrendered their passages and completed the topic recall test and then the criterion posttest.

Results

Probed recall

The means and standard deviations for each group are presented in Table 1.

During the pretesting session, the Extended Range Vocabulary Test from the Kit of Factor Referenced

Results, Probed recall, cont.

Cognitive Tests (Ekstrom, French, & Harmon, 1976) was administered as a global measure of reading ability. Since no differences between groups existed, there was no reason to use the scores as a covariable.

A one-way analysis of variance indicated:

* no significant conditions effect on posttest or change scores, $F(2,37)=1.32, P>.05$
* Regression analysis showed that vocabulary scores were the only significant predictor of posttest or change scores ($p<.05$).

Topic recall

A total of 48 distinctive topical units were presented in the passage. Topic recall was assessed by counting the number of those topics recalled by each student using a keyword analysis. Additionally the number of total words used by each student in recalling topics was divided by the number of topics correctly identified to yield a measure of verbosity in recall. It was expected that if the short semantic labels (average length of 2.2 words) were encoded, the length of the topics recalled would be shorter for than those for the non-labelled groups. Analysis of variance indicated:

* no significant conditions effects on either the number of topics recalled or the verbosity of the replies.

Conclusions from Experiment One

Effects fo blocking

Horizontal rules are used frequently to block text into information units. However, the necessity of such a practice is questionable. The results of the first experiment confirm Hartley's (1980, 1981) contention that there is no need for horizontal rules in order to present information clearly. Spacing between and within columns and rows adds clarity to text in the same way as rules are intended (Hartley & Burnhill, 1978). Since no empirical support exists for the use of rules, they should be used spaingly since spacing can be used to facilitate retrieval just as well (Wright & Fox, 1972).

Effects of headings on recall

Although the scores of students receiving headings improved more than the students not receiving headings, the difference was not significant. Methodologically, the small sample sizes made statistical significance problematic. However the results seem consistent with the pattern of previous results regarding the age and skill level of the learners. The consistent advantages for headings during recall produced by Hartley and colleagues were all with younger learners. With adult learners, the effects seem to dissipate (Cristenson & Stordahl, 1955; Holley et al, 1981; Klare et al, 1958). Older learners appear to to be less affected by the inclusion of headings. Their study and recall strategies appear to be

Effects of headings on recall, cont.

more individually generated and less constrained by adjunct cues, that is, more conceptually driven. Also, the information in the passage was highly meaningful to the readers, since it concerned teaching and was well instantiated. Headings seem to play a more important role as the prose they are signalling becomes more ambiguous , less meaningful, and less organized. Another issue concerns the large number of headings used on this passage. Since so many marginal headings were available, they were perhaps not as well atended to. A smaller number of headings may have served a greater organizer role as predicted by Proger and colleagues (1973). More research is obviosly needed to discover the parameters of usefulness for headings. Headings seem to benefit younger or less skilled learners accessing less meaningful text.

Do learners encode headings?

The inclusion of headings failed to produce any difference in the number of topics recalled or in the level in the content structure of topics recalled (collapsed into a single score in Table 1). The results of this study confirm the low-level cueing role of headings, since so few high level topics were recalled that they were combined with low-level. The number of words used to list topics indicates no headings effect. These findings suggest that older, skilled learners often simply pay no

Do learners encode headings, cont.

attention to headings while comprehending discourse. Their strategies do not nomally include the appropriate headings utilization skills listed by Brooks, et al (1981), such as relating headings to content or memorizing headings as retrieval cues.

EXPERIMENT TWO

Purpose

The purpose of the second experiment was to see if different types of labels (content markers, semantic markers, or questions) would differentially affect probed recall or free recall of topics or the ability to retrieve specific information from text. To what degree would different types of headings or labels affect what gets encoded into memory and is available during recall? Also, to what degree do different types of headings function as access structures or locational cues for retrieving information from familiar text?

Participants

Forty-five upper-level, undergraduate students enrolled in two sections of an educational psychology course at a southeastern university.

Materials

The same passage used in Experiment One was used in this

Materials, cont.

study. The continuous prose version functioned again as the control treatment. In the contnet marker version, marginal labels indicating the type or function of content presented in adjacent block of text were presented. The semantic marker version included marginal labels that described the semantic content of each block of text. This version was synonymous with headings as they are normally conceived. The question version of the passage presented a question that would appropriately be answered by the semantic marker.

Measurement

The criterion test and topic recall tests from Experiment Two were used in this study. In addition, a 41-item, fill-in-the-blank retrieval test derived from the recall items with the key phrases deleted was used. This was an open-book test where learners were required to supply the missing phrase and to confirm actual retrieval, fill in the page number on which the information appeared in the text. An earlier study confirmed the independence of this test from the probed recall test.

Procedures

The procedures used were the same as those used in the first study through the posttest. Two weeks after posttesting, the retrieval test was given. The same booklet and the retrieval test were distributed, and the

Procedures, cont.

students were given 45 minutes to locate as many answers as they could. The time limit was imposed to eliminate a ceiling effect. The retrieval score consisted of the total number of phrases located along with the appropriate page numbers.

Results

Effects on recall and retrieval

The means and standard deviations for each group are presented in Table 2.

A one-way analysis of variance indicated:

* a significant conditions effect for change scores (posttest - pretest): Tukey's HSD test showed that participants in the content marker group recalled significantly less than participants in all the other groups, $F(3,43)=4.70, p<.01$.
* a significant conditions effect for verbosity, ie. number of words per topic recalled: Tukey's HSD test showed that participants in the control group used more words to describe topics than any headings group, $F(3,43)=3.91, p<.05$.
* no other significant main effects: Retrieval scores were nearly identical.

Conclusions from Experiment Two

Effects of different types of headings on recall

The results of Experiment Two confirmed the results of the first. The inclusion of semantic markers did not facilitate probed recall or free recall of topics covered in the passage. The use of questions as headings produced the same lack of effects that Christenson and Stordahl

Effects of different types of headings on recall, cont.

(1955) found. The only consistent advantage for headings have resulted from the work of Hartley and colleagues for lower ability and younger learners. Headings, either as declarative statements or as questions, don't seem to facilitate recall by older, skilled learners. Content markers, which describe the function of information in text (eg. Definition, Examples) and are so integral to text writing systems such as Information Mapping had a detrimental effect on recall. Not only did they not function as retrieval cues, but the content markers also tended to confuse what learners had encoded. Content markers, it seems, serve only a potential access function, but certainly not a facilitative encoding one. Writers should beware of using them without adequately training learners in their usefulness. In certain documents or manuals in which users need to quickly access different types of knowledge, they may be very useful.

Are headings encoded?

The results provide some evidence that the information included in headings may have been encoded, since all the headings groups used significantly less verbiage in recalling the topics than did the control group. Whether this result was actually a function of encoding the headings or only a stylistic influence (lexical brevity) of the headings is not known. Since the control group

Are headings encoded? cont.

recalled as many topics as the headings groups, headings probably did not result in any more semantic processing.

Effects of headings on retrieval of information

The equivalence of the retrieval scores was surprising and inconsistent with earlier results using this passage (Jonassen & Falk, 1980). The accessfunction, relevant to scanning text for information, is the most conceptually obvious advantage for headings, so long as those headings don't miscue learners (Swarts, et al, 1980). The recall and retrieval tests were not related ($\underline{R}$=.16), so there was no facilitative effects of recall on retrieval performance. Perhaps the meaningfulness of the passage contributed most to the tendency not to use the headings as access points.

POST HOC ANALYSIS OF EXPERIMENT TWO

Purpose

The purpose of this post hoc analysis of the second experiment was to determine if Aptitude X Treatment interactions occurred between different types of labelling and reading ability or field independence. Reading ability has always been a strong predictor of recall and has produced significant interactions with variantly structured passages (Jonassen & Pace, 1982). The structuring effects of different types of labels may also

Introduction

Individual difference effects related to headings have been analyzed only as predictors of performance. Task by treatment interactions have resulted, where field independent learners predictably outperformed field dependents on organizational and structural recall tasks but not on verbatim recall (Brooks, et al, 1981).

Field independence and headings

This study analyzed differential effects of treatment on learners as a function of individual differences. No differential effects occurred for the probed recall or retrieval tasks - only for free recall of topics (structural information). For both the total number of topics and the number of low level topics recalled, the presence of semantic markers produced negative slopes when regressed on Hidden Figures scores. That is, field independent students (higher scorers) performed worse on topic recall than field dependent students (low scorers) when the topics are provided. Field independent learners benefit from imposing their own structure on materials, and if that structure is imposed on them, their performance suffers. Question headings produced no differential effects (had a flat slope). Content markers yielded a negative slope on the low level topic recall task. That is, when presented with content markers, field independents recalled fewer low level topics. Field dependents tended to recall more low level topics than

Purpose, cont.

be expected to interact with field independence, since that construct is a measure of an individual's ability to impose his or her own structure on materials.

Measurement

Same as Experiment Two, plus two sub-tests from the Kit of Factor Referenced Cognitive Tests (Ekstrom, French, & Harmon, 1976):

* Extended Range Vocabulary Test - as a global test of reading ability
* Hidden Figures Test - as a measure of field independence

Analysis and results

At the time of pretesting for Experiment Two, the two tests listed above were also administered. Data from each treatment group in Experiment Two were regressed on the aptitude/style variables using generalized regression analysis. The regression analysis indicated:

* significant aptitudeXtreatment interaction for the number of low level topics recalled Treaments interacted with field independence (Hidden Figures scores), $F(3,43)=7.13, p<.01$: The slope of the content marker group was negative, interacting with both the semantic marker and question groups, which had flat slopes.
* significant interaction of treatment and field independence scores on the total number of topics recalled, $F(3,43)=7.64, p<.01$: The semantic marker group had a negative slope intersecting with both question and content marker groups.

Conclusions from Analysis

Field independence and headings, cont.

field independents, which is consistent with related findings in this and other studies. Headings apparantly do not benefit the encoding processes of all learners. Rather effects of headings is dependent on individual differences.

Summary

The pattern of headings effects that is developing predicts that headings will significantly benefit younger, less capable, and less developed learners. Age differences emerge when comparing the results of various studies. Learners who are conceptually less developed seem to benefit most. That is, those learners who are less capable of organizing and structuring materials benefit more from headings which provide those structural cues. That is, they benefit more from data driven strategies. Better developed learners, who prefer to impose their own organizational strategies on the comprehension process, are even deterred by semantic markers that represent the author's structure for the passage. These learners benefit more from conceptually driven comprehension processes. As with so many areas of educational research, future research on headings will be well advised to de-emphasize the search for main effects and concentrate more on the

interaction of individual differences and the use of various types of headings.

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TABLE 1

Variable	Control Passage	Blocked Passage	Semantic Headings Passage
Posttest	30.8 (4.4)	33.2 (5.3)	32.0 (3.6)
Change	3.7 (4.2)	4.8 (6.2)	7.3 (4.5)
Topics Recalled	11.5 (5.1)	11.3 (4.4)	13.3 (3.9)
Topic Verbosity (Words/topic)	3.3 (1.6)	4.7 (2.1)	3.6 (1.7)

TABLE 2

Variable	Control Passage Passage	Content Marker Passage	Semantic Marker Passage	Question Headings Passage
Posttest	37.1 (3.2)	33.3(5.7)	36.0 (4.0)	35.4 (5.8)
Change	8.9 (4.7)	5.1 (3.4)	9.0 (3.1)	9.0 (2.5)
Retrieval	25.7 (8.4)	24.9(7.9)	24.4 (6.2)	25.1 (6.8)
Topics Recalled	10.4 (3.7)	10.9(4.1)	13.8 (4.5)	9.2 (2.6)
Topic Verbosity (Words/topic)	8.1 (4.2)	4.6(1.6)	5.1 (2.5)	4.4 (1.4)

APPENDIX

CONTENT MARKERS

Important Points	Main Points
Definition	Examples
Non-Examples	Introduction
Comment	Synonym
Diagram	Analogy
Purpose	Use
Relationship	Decision
Fact	Characteristic
Type	Part
Formula	Rule
Theorem	Hypothesis
Procedure	Description
Classification	Directions
Notation	Functions
Criteria	Properties
Hints	Overview
Review	Recommendation
Problem	Solution
Principle	Summary
Action	Options
Suggestion	Perspective
Summary	Interpretation
Advantages	Disadvantages
Features	Factors
Distinction	Technique